

SIMULTANEOUS USE OF A FORAGING TRAIL BY TWO
LEAFCUTTER ANT SPECIES IN THE
SONORAN DESERT

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Abstract.—An episode of simultaneous utilization of a foraging trail by two attine ants, *Acromyrmex versicolor* (Pergande) and *Atta mexicana* (F. Smith), is described. No aggressive behavior between the two species was noted, except near an *Acromyrmex* nest entrance. This observation of simultaneous trail use is of particular interest because both species have similar habits and they overlap in selection of food plant species in the Sonoran Desert.

Acromyrmex versicolor (Pergande) is a common leafcutting ant in the desert regions of Arizona and Sonora. The natural history and foraging behavior of this ant has been described by Wheeler (1907) and Gamboa (1975, 1976). The leafcutting ant *Atta mexicana* (F. Smith) ranges from extreme southern Arizona through most of Mexico (Smith 1963). Both species culture fungi and they occur at a study site 46 km south of Sonoita, Sonora, Mexico. The foraging behavior of *Atta mexicana* at this site has been described (Mintzer 1979).

Both ant species cut material from annual and perennial plants and collect dry vegetation. *Atta mexicana* and *Acromyrmex versicolor* exhibit a broad overlap in their selection of target plant species. They cut pieces from the winter annual *Plantago insularis* Eastwood when it is available, and utilize fresh and dry material from the common large desert perennials *Larrea tridentata* Coville, *Olnya tesota* Gray, and *Prosopis velutina* Woot. Their temporal periods of foraging activity are very similar. Both species forage during the day in winter and spring (1974-77; 24 days total observation period).

These mycophagous ants use trails as a regular component of foraging activity. On March 25, 1977, simultaneous use of a 6-8 m trail segment by these two species was noted by the author and field assistant Barry Pullen. Both ant species were collecting leaf pieces from creosote bush, *Larrea tridentata*, and *Plantago insularis*. The trail extended along the side of an arroyo channel. The slope was rough but generally free of debris, and the ants made no effort to clear or level the trail surface. The trail was 6-10 cm wide; trails of *Atta mexicana* are usually 3-5 cm across (unpub. observation), while those of *Acromyrmex versicolor* are up to 14 cm in width (Gamboa 1975). One end of the trail terminated at a nest opening of the *Acro-*



Figs. 1, 2. 1. Section of trail used by *Atta mexicana* and *Acromyrmex versicolor*. Lower left: *Acromyrmex versicolor* forager with cut item from *Plantago insularis*. Upper right: *Atta mexicana* forager with cut leaf from *Larrea tridentata*. 2. Another section of the trail. From lower left to upper right: *Acromyrmex versicolor*; *Atta mexicana*; *A. mexicana* (submajor with forage item); *Acromyrmex versicolor*; *A. versicolor* (with forage item). *Atta mexicana* foragers have longer legs than the *Acromyrmex versicolor* foragers of comparable size.

myrmex colony, which was surrounded by a pile of cut pieces from *L. tridentata*. *Acromyrmex* workers were returning to this nest entrance with forage items during the period of observation, while *Atta* workers with forage items traveled in the opposite direction, towards their own tunnel opening (see figures). *Acromyrmex* workers attacked and chased *Atta* foragers they encountered on this pile or near the nest entrance. B. Pullen observed six dead or injured *Acromyrmex* and one dead *Atta* worker near this entrance. Most *Atta* workers left the trail about 60 cm from the *Acromyrmex* nest entrance and foraged individually, returning to the trail after securing leaf pieces. Foragers of both species were well represented when the trail was first noted around 1300 hr local time. Seventy *Acromyrmex* and 66 *Atta* workers passed a fixed point on the trail during a five minute period. No aggressive interactions were noted on the trail, except within 25 cm of the *Acromyrmex* nest opening. However, *Atta* became less abundant on the trail later in the afternoon.

The *Atta* colony involved in this episode produced up to 30 trails simultaneously, and at least two *Acromyrmex versicolor* colonies were located near the margins of its foraging area. The one episode of simultaneous use of a trail occurred shortly after a period of rain, when *Acromyrmex* was very active on the surface. The *Atta* foragers may have initially been attracted to the accumulation of *L. tridentata* leaf pieces around the *Acromyrmex* nest entrance. From my observations, it was impossible to determine whether both species are capable of following each other's trails, or which ant produced the initial trail.

In the laboratory, some attine species follow trails produced using abdominal gland extracts from other attine species and genera. In *Atta texana* (Buckley), the poison gland in the abdomen is the source of the primary trail pheromone (Blum et al. 1964; Moser 1967). Moser notes: "In the field, however, although the trails of various species cross, the workers generally find their own trails easily." For a more typical account of relations between foragers of two *Atta* species, check Weber (1969). At the study site in Mexico, *Acromyrmex* was active on only a few observation days, and trails of the two species were not observed near each other on other occasions when simultaneous foraging activity occurred.

Wilson (1965) describes a case of simultaneous trail use by two ants on Trinidad, and reviews two cases discovered by W. M. Wheeler in neotropical forest. In two of these cases involving *Crematogaster limata parabiotica* Forel [with *Camponotus femoratus* (Fabricius) and *Monacis debilis* (Emery)], some of the shared trails led to food resources such as membracids used by both ants involved, and no aggressive interactions were noted. In the third case, *Camponotus beebei* Wheeler utilized trails of *Azteca chartifex* Forel, and some aggressive interactions were noted on the trails.

In all of these reports, the two ant species involved belong to different subfamilies (Myrmicinae, Dolichoderinae, or Formicinae). In contrast, *Atta* and *Acromyrmex* are closely related myrmicine genera (Weber 1972). Simultaneous use of a foraging trail is particularly interesting in this case because the species involved are members of a smaller and more recently evolved phyletic group with similar and unique dietary habits, and they may be expected to compete for resources where they occur together.

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